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**Title:** TW0425495B: A POLARIZATION MASK WITHOUT CHROMIUM

**Derwent Title:** A polarization mask without chromium - with simpler process and reduced particle contamination [Derwent Record](#)

**Country:** TW Taiwan

**Kind:** B Patent

**Inventor:** LIN, SZ-MIN; Taiwan

**Assignee:** UNITED MICROELECTRONICS CORP. Taiwan  
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**Published / Filed:** 2001-03-11 / 1999-12-01

**Application Number:** TW1999088120944

**IPC Code:** G03F 9/00;

**ECLA Code:** None

**Priority Number:** 1999-12-01 TW1999088120944

**Abstract:**

The present invention proposes a polarization mask without chromium, which includes a transparent plate, a first polarization layer on one portion of region of the transparent plate, and a second polarization layer located on the transparent plate and one portion of region on the first polarization plate overlapped with the first polarization layer, wherein the polarization direction of the second polarization layer is perpendicular to the first polarization layer. The present invention provides a method to form a polarization mask, which includes providing a transparent plate, forming the first polarization layer on the transparent plate, and etching the first polarization layer. Then form the second polarization layer on the transparent plate and the first polarization plate, and etch one portion of the second polarization layer on the first polarization layer, so that the first polarization layer and the second polarization layer has an overlapped region.

**Family:**

PDF	Publication	Pub. Date	Filed	Title
<input checked="" type="checkbox"/>	TW0425495B	2001-03-11	1999-12-01	A POLARIZATION MASK WITHOUT CHROMIUM
1 family members shown above				

**Other Abstract Info:** None

**Text of Public Notice**

**Date of application: December 1, 1999**

**File No.: 88120944**

**Type: G03F9/00**

**The above space to be completed by this Bureau**

**Description of Invention Patent      425495**

**One. Title of Invention**

**Chinese: Polarized mask without chromium**

**English:**

**Two. Inventor**

**Name (Chinese): 1. Lin Tsih Min**

**Name (English): 1.**

**Nationality: Republic of China**

**Domicile or residence: 3<sup>rd</sup> fl., No. 165, Lane 89, Section 1, Kuang Fu Road, Hsin Chu**

**Three. Applicant**

**Name (Chinese): 1. UMC**

**Name (English): 1.**

**Nationality: Republic of China**

**Domicile or residence (Firm): No. 3, Li-Hsin 2<sup>nd</sup> Rd., Science Industrial Park, Hsin Chu City, 300**

**Name of representative (Chinese): Tsao Hsing Cheng**

**Name of representative (English):**

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Four. Excerpt of invention in Chinese (Title of invention: polarized mask without chromium)

This invention proposes a polarized mask without chromium, which includes a transparent panel, which overlaps with said first polarized layer in part of the area of first polarized layer, of which the polarization direction of said second polarized layer is perpendicular to the first polarized layer. This invention provides a method for forming a polarized mask, which includes providing a transparent panel, forming a first polarized layer on the transparent panel, etching the first polarized layer. Then, form a second polarized layer on the transparent panel and the first polarized layer, and etch part of the second polarized layer above said first polarized layer, thus causing an overlapping area between said first polarized layer and said second polarized layer.

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Excerpt of invention in English (title of invention:)

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A patent application has been submitted to \_\_\_\_\_ country (region) on \_\_\_\_\_  
(date of application), with \_\_\_\_\_ application No., and claim priority right

None

The relevant microorganism has been hosted on \_\_\_\_\_, date of hosting \_\_\_\_\_,  
hosting No.

None

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Five. Invention Notes (1)

5-1 Field of invention:

This invention is about a polarized exposure device, especially about a polarized mask without chromium and its manufacturing method.

5-2 Background of the invention:

With continued reduction in critical sizes, the current optic lithography technology has advanced to the limits of resolution. One method for increasing the optic resolution and reducing the distance between patterns is to use the dual image exposure system. Figure 1 shows a lithography device that traditionally uses two layers of chromium mask. In Figure 1, a light source (not shown in the figure) emits light from above, and when light passes through the first mask, it is shielded by chromium 120 of a transparent panel 130, and then is shielded by chromium 122 on another transparent panel 132 when passing through a second mask. Finally, it is projected a wafer 100, thus exposing light resistance 110 on wafer 100. This method resolves the issue that the distance between patterns cannot be too close in traditional mask technologies, thus improving optic resolution. However, although this method may increase optic resolution, output and the precision of optic alignment are still key considerations. This is because optic interference between the first mask and the second mask and diffusion still exist.

Another method to increase optic resolution is to use the optic polarization phenomenon. As shown in Figure 2, a mask has a transparent panel 134, and forms a chromium pattern 124 on transparent panel 134 after the pattern transfers chromium. A first polarized panel 150 and a second polarized panel 152 are respectively formed on chromium pattern 124 and transparent panel 134, of which the direction of the first polarized panel 150 is perpendicular to the direction of the second polarized panel 152.

If two polarized panels are placed between the mask and the light source, the direction of one of such polarized panels will be identical to the first polarized panel 150, while the direction of the other polarized panel will be identical to the second polarized panel 152. Then light passing through the first polarized panel 150 cannot pass through the second polarized panel 152, and light passing through the second polarized panel 152 cannot pass through the first polarized panel 150. Compared with the exposure device in Figure 1, in effect, this is as if two masks are used, thus increasing the optic resolution, while at the same time resolving the issues of optic interference between the two masks and diffusion. However, this method of forming a mask requires three steps (the formation of chromium and two polarized plates) before a piece of mask can be completed. In addition, its relatively complex steps can easily generate particle contamination.

### 5-3 The purpose and summary of the invention:

In view of the many deficiencies generated by the traditional polarized masks in the aforementioned background for the invention, the main purpose of this invention is to provide a polarized mask without chromium, of which the method for the formation of the mask is simpler than the more traditional polarized mask.

Another purpose of this invention is that the steps for formatting a mask will be capable of reducing particle contamination.

## Five. Invention notes (3)

Based on the purpose described above, this invention provides a polarized mask without chromium, which includes a transparent plate made of quartz, a first polarized layer in part of the area of first polarized layer, a second polarized layer, which is on said transparent panel and which overlaps with said first polarized layer in part of the area of first polarized layer, of which the polarization direction of said second polarized layer is perpendicular to the first polarized layer. This invention provides a method for forming a polarized mask, which includes providing a transparent panel, forming a first polarized layer on the transparent panel, etching the first polarized layer. Then, form a second polarized layer on the transparent panel and the first polarized layer, and etch part of the second polarized layer above said first polarized layer, thus causing an overlapping area between said first polarized layer and said second polarized layer.

## 5-4 A simple explanation of the figures:

The aforementioned purposes and advantages of this invention will be explained in detail below with the following implementation examples and figures, of which:

Figure 1 is a structural sketch of the traditional dual exposure device for masks;

Figure 2 is a structural sketch of the traditional polarized mask;

Figure 3 is a structural sketch of the mask without chromium based on this invention; and

Figure 4 is a sketch of the directions of polarizations of the two polarized plates on the mask in this invention;

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Five. Invention Notes (4)

Figures 5A to 5D are the structural sketches for the steps of forming a polarized mask without chromium; and

Figure 6 is a sketch of the appropriate location in the exposure device of the polarized mask without chromium based on this invention.

The representative keys of the main parts:

- 1 Light source
- 2 Focusing lens group
- 3 Reduced projection lens group
- 4 Wafer
- 5 Polarized panel
- 10 Transparent panel
- 20 First polarized layer
- 22 Second polarized layer
- 25 Overlapping areas
- 30 Polarized mask without chromium
- 40 Light resistance layer
- 100 Base materials
- 110 Light resistance
- 120 Chromium
- 122 Chromium
- 124 Chromium



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Five. Invention Notes (5)

130 Transparent panel  
132 Transparent panel  
134 Transparent panel  
150 First polarized layer  
152 Second polarized layer

5-5 Detailed notes on the invention:

Some of the implementation examples of this invention are described in detail below. However, in addition to the detailed descriptions, this invention may also be extensively implemented in other implementation examples, and the scope of this invention is not limited and shall be subject to the scope of subsequent patents.

Traditional masks form a chromium pattern first on a transparent panel, but the process of the chromium pattern formation will inevitably generate contamination. This invention mainly uses the optic polarization characteristics to replace the chromium pattern, thus, the mask in this invention does not need to form a chromium pattern any longer. Next is an introduction of the polarized mask in this invention, before an introduction is given about the manufacturing methods of the formation of the mask in this invention. Finally, the mask in this invention is applied on the exposure device during the lithography process.

Figure 3 is a structural sketch of the polarized mask 30 without chromium in this invention. On a transparent panel 10, there are two polarized layers 20 and 22. The material of transparent panel 10 is usually quartz, however, other transparent materials may also be used. On transparent panel 10, there is the first polarized layer 20 and the second polarized layer 22. Of these, between the first polarized layer 20 and the second polarized layer 22, there is an overlapping area 25. This invention uses this overlapping area 25 to replace traditional chromium.

## Five. Invention Notes (6)

Since chromium on traditional masks block the path of the light, in Figure 3, the overlapping area 25 between the first polarized layer 20 and the second polarized layer 22 should also be capable of blocking the path of the light. The key to this invention is to place the direction of the polarization the first polarized layer 20 and the direction of the polarization of the second polarized layer 22 perpendicularly, as shown in Figure 4. Therefore, the overlapping area 25 on transparent panel 10 may replace the traditional chromium. Having undergone lithography by polarized light, the pattern on overlapping area 25 can project onto a wafer, thus forming a pattern for an integrated circuit.

Next is an introduction of the technology disclosed on the basis of this invention, with a structural sketch for the steps of forming a polarized mask without chromium. As shown in Figure 5A, first, provide a transparent panel 10, whose material is usually quartz. In the traditional manner, on the transparent panel, a first polarized layer 20 and a light resistant layer 40 are formed. Then, transfer a pattern onto the light resistant layer 40, and the light resistant layer 40 etches the first polarized layer 20 for the shield mask, as shown in Figure 5B. Subsequently, remove the light resistant layer 40 using the traditional method. As shown in Figure 5C. above the first polarized layer 20 and the transparent panel 10, a second polarized layer 22 forms. Finally, remove part of the second polarized layer 22 using the same method, as shown in Figure 5D. The removed polarized layer 22 is above part of the first polarized layer 20, thus creating an overlapping part between the first polarized layer 20 and the second polarized layer 22.

## Five. Invention Notes (7)

Next is an introduction of the application polarized mask 30 without chromium in this invention on the polarized the exposure device. As shown in Figure 6, the polarized the exposure device includes a light source 1 to generate light, and two sets of polarization panels 5a and 5b are used to polarize the light generated by light source 1 in two directions, respectively, a set of focus lens 2 is used to focus the light, a mask 30 is used to selectively pass through the light, and a reduced set of project lens 3 reduces the light in size and projects it onto a wafer 4.

During the use of polarized mask 30 without chromium in this invention, the two sets of polarization panels 5a and 5b are between light source 1 and focus lens set 2, and polarizes the light emitted by light source 1, respectively. Of this, the direction of such polarization is identical to the polarization layer on mask 30. The polarized mask 30 without chromium only lets light pass the preset pattern through the focus lens set 2, which is between the focus lens set 2 and the reduced projection lens set 3.

Therefore, the light emitted from light source 1 can only pass through one of the sets of polarization panels 5a and 5b. If light passes through the first polarization panel 5a, then light is polarized in the direction of the first polarization panel 5a. The polarized light radiates onto polarized mask 30 without chromium after being focused by the focusing lens set 2. Since there are two polarized layers 20 and 22 on mask 30, light on mask 30 can only pass through one of the polarized layers, such as polarized layer 20 (which does not include overlapping area 25). Subsequently, light is projected onto wafer 4 by reduced projection lens set 3, of which the surface of wafer 4 has a light resistant layer (not shown in the figure).

By contrast, after passing through second polarized layer panel 5b, light can only pass through polarized layer 22 on mask 30 (which does not include overlapping area 25), and then is projected onto wafer 4 by reduced projection lens set 3.

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Five. Invention Notes (8)

Based on the above description, there are only two steps for making the polarized mask without chromium in this invention (two polarized layers). Compared with the traditional manufacturing process of polarized masks, the steps reduced not only increases the quality pass ratio and output of masks, but also reduces the occurrence of particle contamination.

The above description is only a good implementation example of this invention, and is not to be used to limit the scope of patent application of this invention; all other equal changes or finishing touches not deviating from the spirit disclosed by this invention shall be included in the scope of patent application of this invention.

Six. Scope of patent application

1. A polarized mask, which at least includes:

A transparent panel;

A first polarized layer, which is in part of the area on said transparent panel;

And

A second polarized layer, which is on said transparent panel and which overlaps with said first polarized layer in part of the area of first polarized layer, of which the polarization direction of said second polarized layer is perpendicular to the first polarized layer.

2. With regard to the mask in Claim 1 of the scope of patent application, the material for the aforementioned transparent panel is quartz.

3. With regard to the mask in Claim 1 of the scope of patent application, the overlapping area between the first polarized layer and the second polarized layer described above is projected onto a wafer and then forms an integrated circuit.

4. A method for forming a polarized mask, which method shall at least include:

Providing a transparent panel;

Forming a first polarized layer on said transparent panel;

Etching part of said first polarized layer;

Forming a second polarized layer on said transparent panel and said first polarized layer;  
and

Etching part of said second polarized layer above said first polarized layer, thus causing an overlapping area between said first polarized layer and said second polarized layer.

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Six. Scope of patent application

5. With regard to the method in Claim 4 of the scope of patent application, the material of the transparent panel described above is quartz.

6. With regard to the mask in Claim 1 of the scope of patent application, the overlapping area between the first polarized layer and the second polarized layer described above is projected onto a wafer and then forms an integrated circuit.

7. With regard to the mask in Claim 1 of the scope of patent application, the polarization direction of said second polarized layer described above is perpendicular to the polarization direction of the first polarized layer.

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Figures

Figure 1

Figure 2

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Figures

Figure 3

Direction of second polarized panel 22

Direction of second polarized panel 20

Figure 4

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Figures

Figure 5A

Figure 5B

Figure 5C

Figure 5D

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Figures

Figure 6

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Title of application: polarized mask without chromium

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Title of application: polarized mask without chromium

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# 公告本

申請日期: 88.12.1	案號: 88120944
類別: G03F9/00	

(以上各欄由本局填註)

## 發明專利說明書

425495

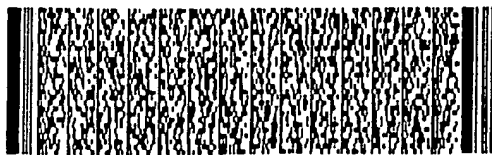
一、發明名稱	中文	不具有銘之偏極化光罩
	英文	
二、發明人	姓名 (中文)	1. 林思閻
	姓名 (英文)	1.
	國籍	1. 中華民國
	住、居所	1. 新竹市光復路一段89巷165號3樓
三、申請人	姓名 (名稱) (中文)	1. 聯華電子股份有限公司
	姓名 (名稱) (英文)	1.
	國籍	1. 中華民國
	住、居所 (事務所)	1. 300新竹科學工業園區新竹市力行二路三號
	代表人姓名 (中文)	1. 曹興誠
	代表人姓名 (英文)	1.



## 四、中文發明摘要 (發明之名稱：不具有銘之偏極化光罩)

本發明提出一種不具有銘之偏極化光罩，其包含一透明平板，一位於透明平板上之一部份區域之第一偏極層，以及一第二偏極層，係位在透明平板上以及在第一偏極層上之一部分區域上與第一偏極層重疊，其中第二偏極層之偏極化方向與第一偏極層垂直。本發明提供一種形成偏極化光罩的方法，其中包含提供一透明平板，然後在透明平板上形成一第一偏極層，並且蝕刻第一偏極層。之後，在透明平板與第一偏極層上形成一第二偏極層，並且蝕刻一部份位於第一偏極層上的第二偏極層，使得第一偏極層與第二偏極層具有一重疊的區域。

## 英文發明摘要 (發明之名稱：)



425495

本案已向

國(地區)申請專利

申請日期

案號

主張優先權

無

有關微生物已寄存於

寄存日期

寄存號碼

無

## 五、發明說明 (1)

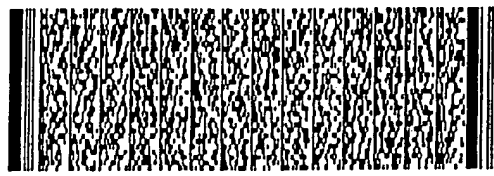
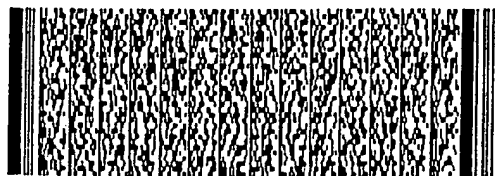
## 5-1 發明領域：

本發明係有關於一種偏極化曝光裝置，特別是有關於一種不具有銻之偏極化光罩及其製造方法。

## 5-2 發明背景：

當臨界尺寸持續的緊縮，目前光學微影技術已經推進到解析極限。一種增加光學解析度與縮小圖案間距的方式是使用雙重影像曝光系統。如第一圖所示，顯示一種傳統使用兩層銻光罩的微影裝置。在第一圖中，一光源（未在圖中顯示）從上發射光線經過第一光罩時被一透明平板130的銻120遮住，然後再經由第二光罩時被另一透明平板132上的銻122遮住。最後，投影到一晶圓100上，使得晶圓100上的光阻110曝光。這種方式解決了傳統光罩技術上，圖案間距不能太接近的問題因而提高了光學解析度。然而，這種方式雖然可以增加光學解析度，但是產量以及光學對準的精確度仍然是考量的關鍵。這是因為在第一光罩與第二光罩之間的光學上的干涉以及散射仍然存在。

另一種增加光學解析度的方式，是利用光學的偏極化現象。如第二圖所示，一光罩具有一透明平板134，並且藉由圖案轉移銻之後在透明平板134上形成一銻圖案124。在銻圖案124以及透明平板134上面分別形成一第一偏極板





## 五、發明說明 (2)

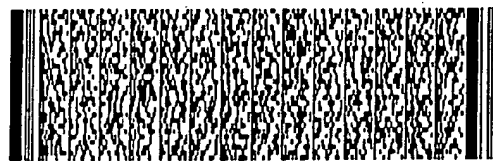
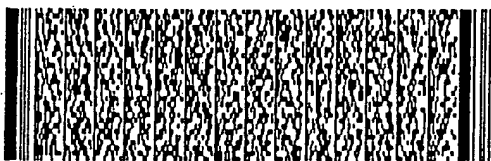
150與一第二偏極板152，其中第一偏極板150的方向與第二偏極板的方向152垂直。如果在光罩與光源之間放置兩片偏極板，其中一片偏極板的方向與第一偏極板150相同，而另一片偏極板的方向與第二偏極板152相同，則透過第一偏極板150的光線不能透過第二偏極板152，透過第二偏極板152的光線不能透過第一偏極板150。與第一圖的曝光裝置相比較，等效上如同應用了兩片光罩而增加了光學解析度，同時又解決了兩層光罩之間的光學干涉以及散射的問題。然而，這種方式所形成的光罩需要三個步驟（形成鉻以及兩個偏極板）才能完成一片光罩。再者，其較複雜的步驟容易產生微粒污染（particle contamination）。

## 5-3 發明目的及概述：

鑒於上述之發明背景中，傳統的偏極化光罩所產生的諸多缺點，本發明主要目的在於提供一不具有鉻之偏極化光罩，其中形成光罩的方式較傳統的偏極化光罩簡潔。

本發明的另一目的在於形成光罩的步驟可以減少微粒的污染。

根據以上所述之目的，本發明提供了一種不具有鉻之偏極化光罩，其包含一材質為石英的透明平板，一位於透



## 五、發明說明 (3)

明平板上之一部份區域的第一偏極層，以及一第二偏極層，係位在透明平板上以及在第一偏極層上之一部分區域上與第一偏極層重疊，其中第二偏極層之偏極化方向與第一偏極層垂直。本發明提供一種形成偏極化光罩的方法，其中包含提供一透明平板，然後在透明平板上形成一第一偏極層，並且蝕刻第一偏極層。之後，在透明平板與第一偏極層上形成一第二偏極層，並且蝕刻一部份位於第一偏極層上的第二偏極層，使得第一偏極層與第二偏極層具有一重疊的區域。

## 5-4 圖式簡單說明：

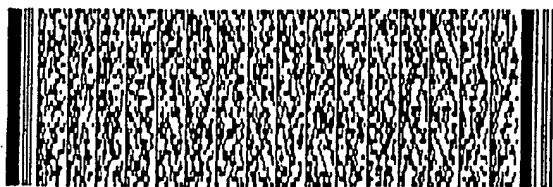
本發明之上述目的與優點，將以下列的實施例以及圖示，做詳細說明如下，其中：

第一圖為傳統的雙重光罩之曝光裝置的結構示意圖；

第二圖為傳統的偏極化光罩的結構示意圖；

第三圖係依據本發明之不具有鉻的偏極化光罩的結構示意圖；

第四圖顯示在本發明的光罩上兩個偏極板偏極方向示意圖；



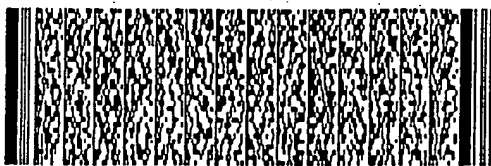
## 五、發明說明 (4)

第五A圖到第五D圖係根據本發明所揭露之技術，在形成不具有鉻的偏極化光罩時的各步驟結構示意圖；及

第六圖係根據本發明不具有鉻的偏極化光罩，應在曝光裝置之示意圖。

主要部分之代表符號：

- 1 光源
- 2 聚焦透鏡組
- 3 縮小投射透鏡組
- 4 晶圓
- 5 偏極板
- 10 透明平板
- 20 第一偏極層
- 22 第二偏極層
- 25 重疊區域
- 30 不具有鉻之偏極化光罩
- 40 光阻層
- 100 底材
- 110 光阻
- 120 鉻
- 122 鉻
- 124 鉻



## 五、發明說明 (5)

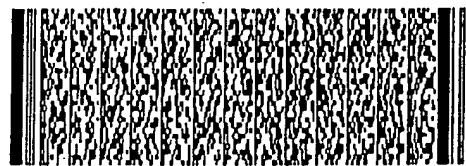
- 130 透明平板
- 132 透明平板
- 134 透明平板
- 150 第一偏極層
- 152 第二偏極層

## 5-5 發明詳細說明：

本發明的一些實施例會詳細描述如下。然而，除了詳細描述外，本發明還可以廣泛地在其他的實施例施行，且本發明的範圍不受限定，其以之後的專利範圍為準。

由於傳統的光罩在是在一透明平板上先形成一鉻圖案，然而形成鉻圖案的過程不可避免的會產生污染。本發明主要是利用光學偏極化的特性來代替鉻圖案，因而本發明之光罩不需要再形成一鉻圖案。接下來先介紹本發明之偏極化光罩，然後再介紹形成本發明之光罩的製造方法。最後，將本發明之光罩應用在微影過程中的曝光裝置。

如第三圖所示，係依據本發明之不具有鉻的偏極化光罩30的結構示意圖。一透明平板10上面有兩層偏極層20，22。透明平板10的材質通常為石英，然而可以使用其他的透明材質。在透明平板10的上面有一第一偏極層20與一第二偏極層22，其中第一偏極層20與第二偏極層22有一重疊



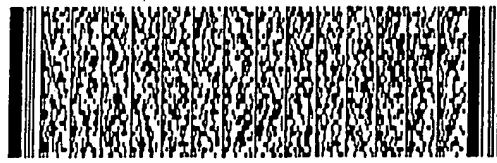
## 五、發明說明(6)

區25。本發明係利用這一重疊區域25替代傳統的銘。

由於傳統光罩上的銘具有阻擋光行經路線，因此第三圖中第一偏極層20與第二偏極層22的重疊區25也要具備阻擋光行經路線的能力。本發明的主要關鍵是將第一偏極層20的偏極化方向與第二偏極層22的偏極化方向垂直，如第四圖所示。因此，在透明平板10上的重疊區域25可以取代傳統的銘。經由偏極化光的微影之後，重疊區域25的圖案會在一晶圓上投影形成積體電路的圖案。

接下來介紹根據本發明所揭露之技術，在形成不具有銘的偏極化光罩時的各步驟結構示意圖。如第五A圖所示，首先提供一透明平板10，其材質通常為石英，並且以傳統的方式依序在透明平板上形成一第一偏極層20與一光阻層40。接者，將一圖案轉移到光阻層40上，並且光阻層40為遮罩蝕刻第一偏極層20，如第五B圖所示。之後，以傳統的方式移除光阻層40。如第五C圖所示，在第一偏極層20與透明平板10的上面形成一第二偏極層22。最後，以上述相同的方式將一部份的第二偏極層22移除，如第五D圖所示。被移除的第二偏極層22係在一部份之第一偏極層20上方，使得第一偏極層20與第二偏極層22具有重疊的部份。

接著，介紹以本發明之不具有銘之偏極化光罩30應用



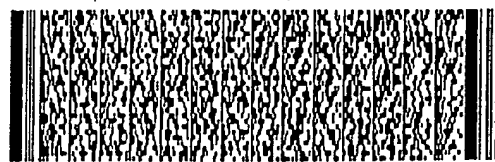
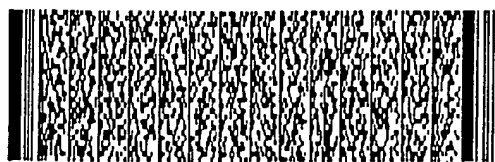
## 五、發明說明 (7)

在偏極化曝光裝置上。如第六圖所示，偏極化曝光裝置包含一光源1係用以產生光線，兩組偏極板 5a 與 5b 分別用以將光源1產生的光線偏極化成兩種方向，一聚焦透鏡組2用以將光線聚焦，一光罩30用以選擇性的通過光線，以及一縮小投影透鏡組3將光線縮小並投射到一晶圓4上。

在使用本發明之不具有銘之偏極化光罩30中，兩組偏極板 5a 與 5b 係位於光源1與聚焦透鏡組2之間，是將光源1所發射的光線分別地偏極化，其中偏極化的方向與光罩30上的偏極層相同。不具有銘之偏極化光罩30只讓光線經由聚焦透鏡組2通過預設的圖案，係位於聚焦透鏡組2與縮小投影透鏡組3之間。

因此，從光源1發射的光線只能經由兩組偏極板 5a 與 5b 中的一個。如果光線經由第一偏極板5a，則光線被偏極成第一偏極板 5a 的方向。偏極後的光線經由聚焦透鏡組2聚焦之後輻射到不具有銘之偏極化光罩30上。由於光罩30上具有兩種偏極層20與22，在光罩30上的光只能通過其中一種偏極層，比如偏極層20（並不包含重疊區域25）。之後，經由縮小投影透鏡組3將光線投射到晶圓4上，其中晶圓4的表面具有光阻層（未在圖中顯示）。

相反地，光線經過第二偏極板5b之後，只能經過光罩30上的另一個偏極層22（並不包含重疊區域25），然後經

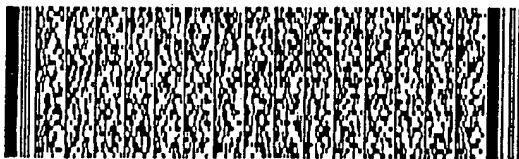


## 五、發明說明(8)

由縮小投影透鏡組3將光線投射到晶圓4上。

由上所述，本發明之不具有鉻之偏極化光罩30的製造步驟只有兩個（兩個偏極層），與傳統的偏極化光罩製造過程相比，減少的步驟不但可以增加光罩製造的良率與產出，同時可以減少微粒污染的發生。

以上所述僅為本發明之較佳實施例而已，並非用以限定本發明之申請專利範圍；凡其它未脫離本發明所揭示之精神下所完成之等效改變或修飾，均應包含在下述之申請專利範圍內。



## 六、申請專利範圍

## 1. 一種偏極化光罩，至少包含：

一透明平板；

一第一偏極層，係位於該透明平板上之一部份區域；

及

一第二偏極層，係位在該透明平板上以及在該第一偏極層上之一部分區域上與部分該第一偏極層重疊，其中該第二偏極層之偏極化方向與該第一偏極層垂直。

## 2. 如申請專利範圍第1項之光罩，其中上述透明平板之材質為石英。

## 3. 如申請專利範圍第1項之光罩，其中上述之第二偏極層與第一偏極層重疊區域經由微影投射到一晶圓後形成積體電路。

## 4. 一種形成偏極化光罩的方法，該方法至少包含：

提供一透明平板；

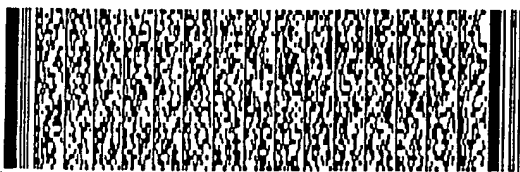
在該透明平板上形成一第一偏極層；

蝕刻該第一偏極層的一部份；

在該透明平板與該第一偏極層上形成一第二偏極層；

及

蝕刻一部份位於該第一偏極層上的該第二偏極層，使得該第一偏極層與該第二偏極層具有一重疊的區域。





## 六、申請專利範圍

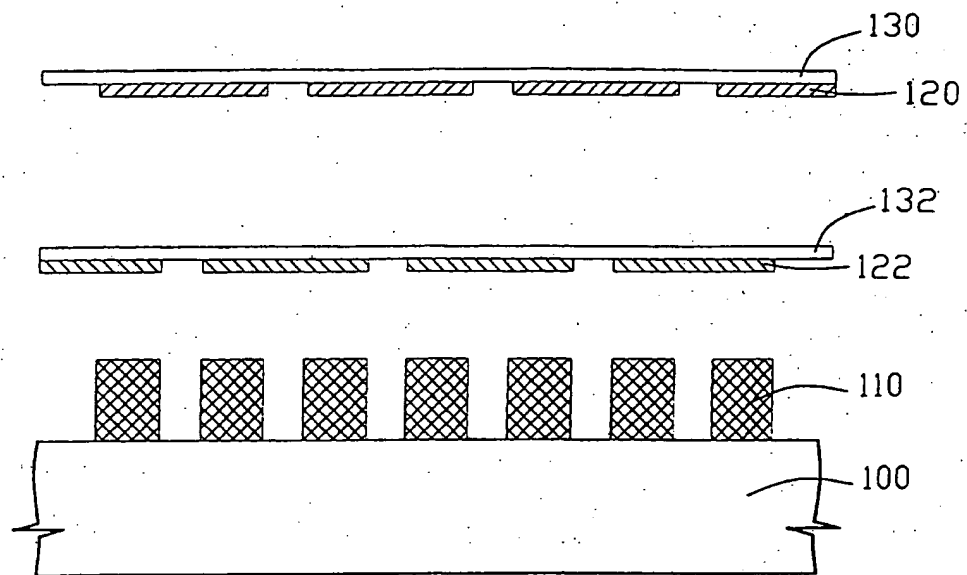
5. 如申請專利範圍第4項之方法，其中上述透明平板之材質為石英。

6. 如申請專利範圍第4項之方法，其中上述之第二偏極層與第一偏極層重疊區域經由微影投射到一晶圓後形成積體電路。

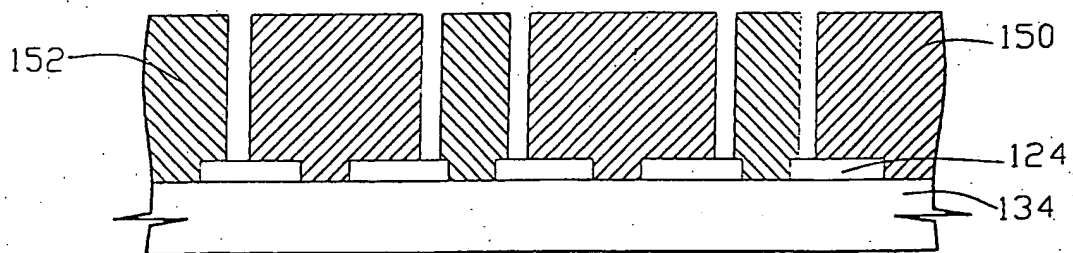
7. 如申請專利範圍第4項之方法，其中上述之第二偏極層之偏極化方向與該第一偏極層之偏極化方向垂直。



圖式

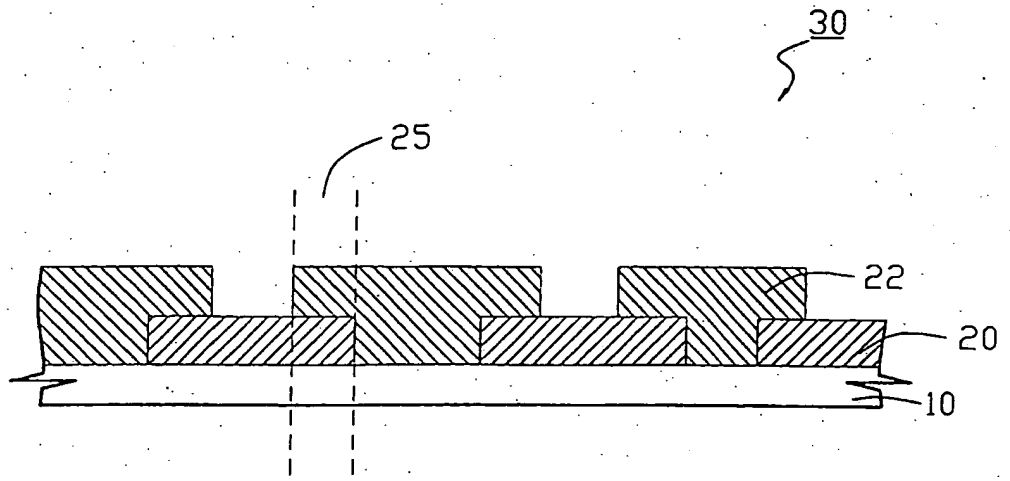


第一圖

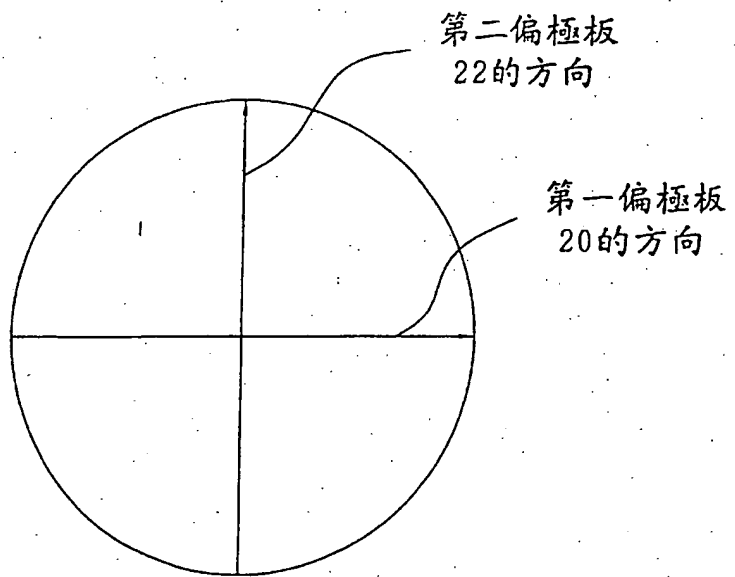


第二圖

圖式

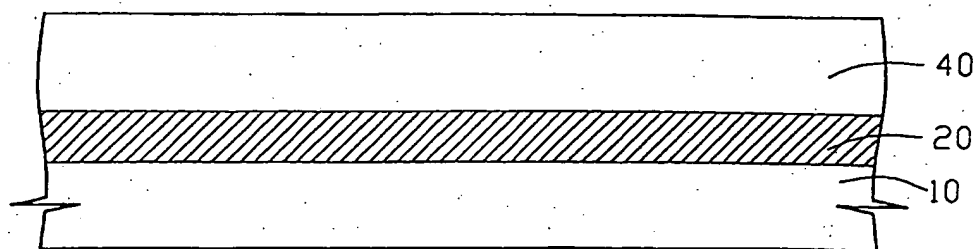


第三圖

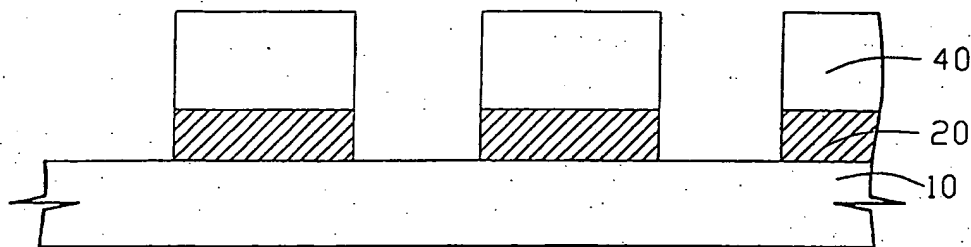


第四圖

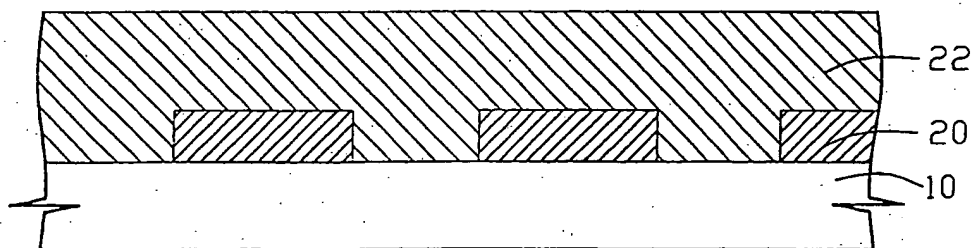
圖式



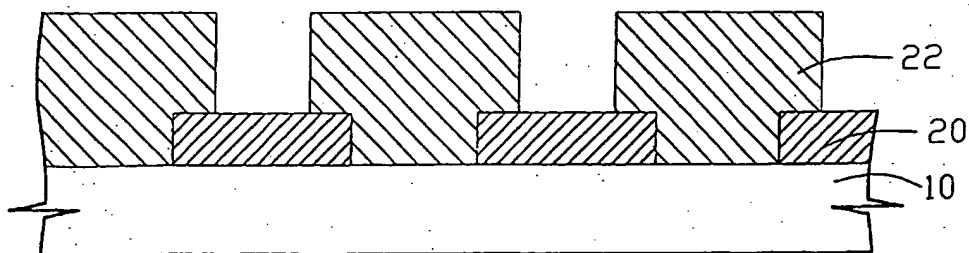
第五A圖



第五B圖

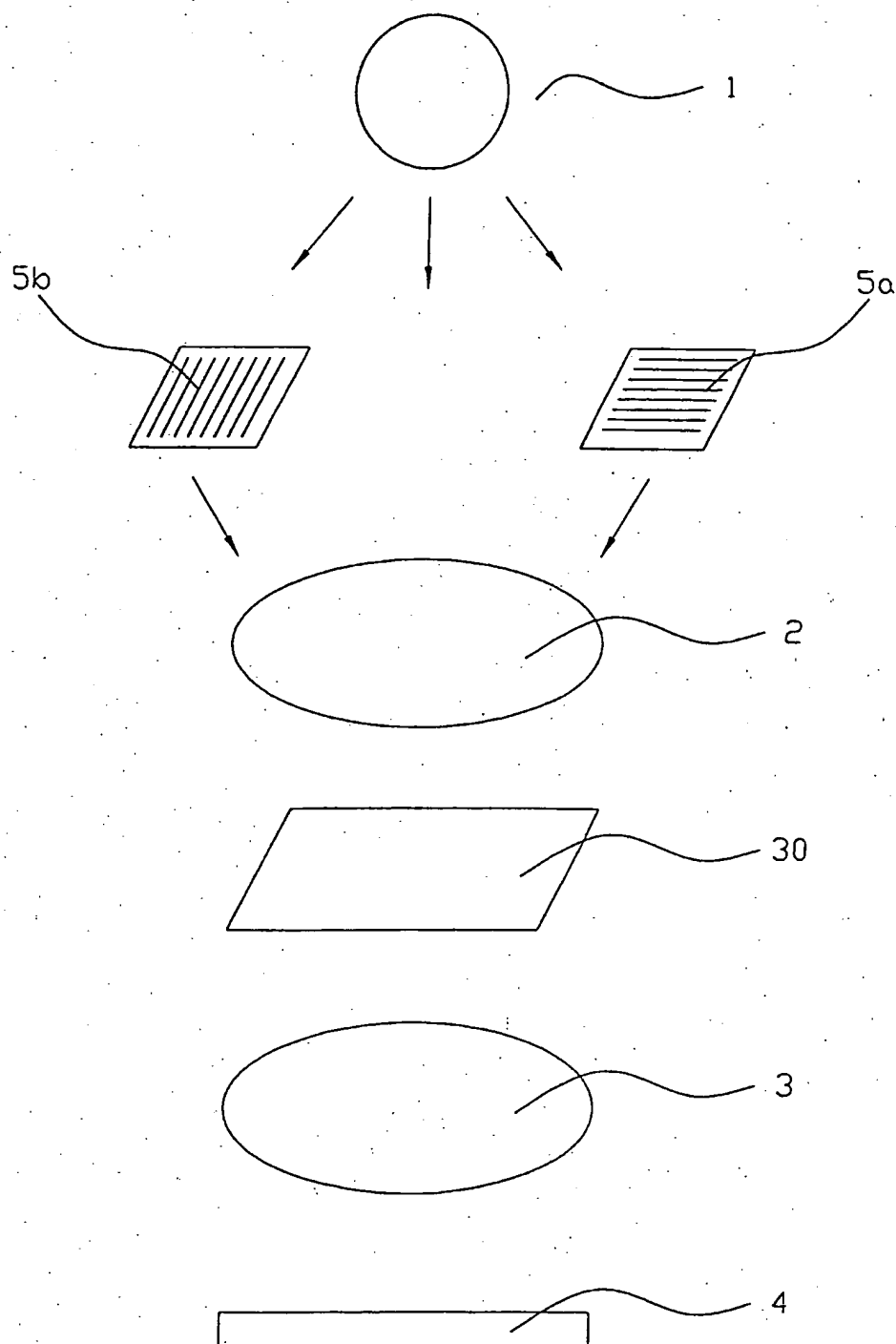


第五C圖



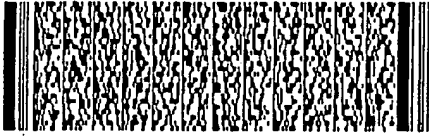
第五D圖

圖式

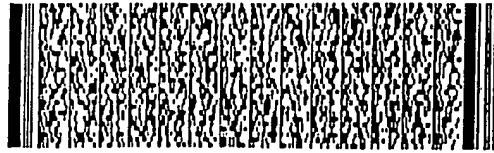


第六圖

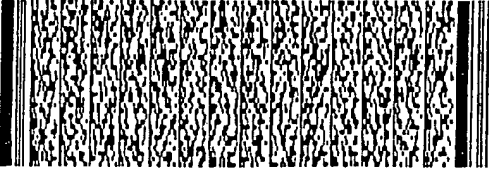
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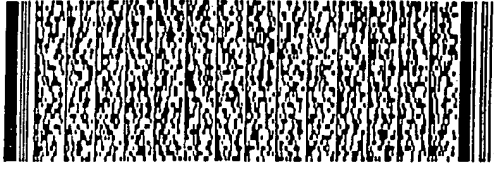
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第 4/13 頁



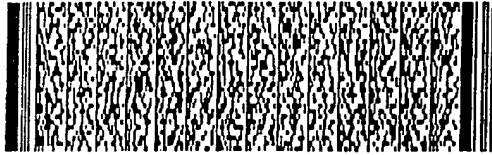
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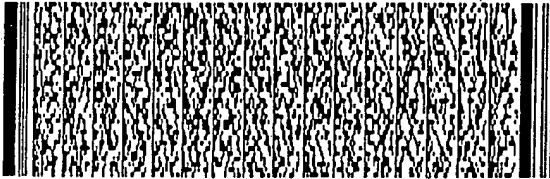
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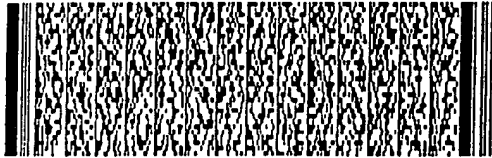
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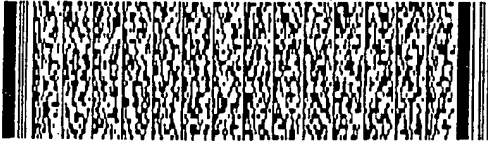
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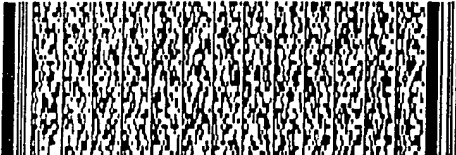
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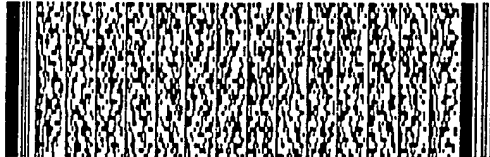
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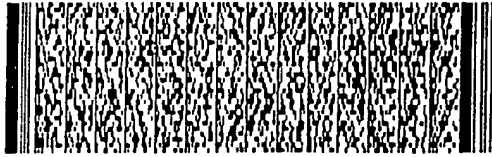
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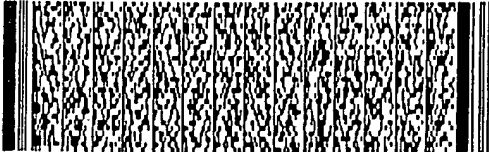
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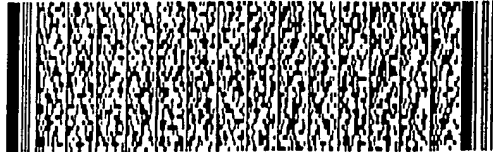
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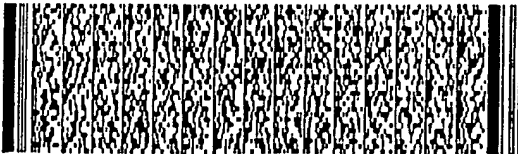
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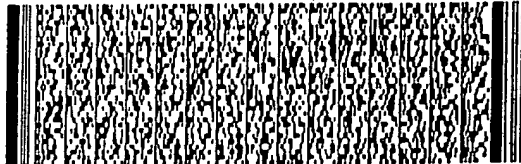
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425435 申請案件名稱:不具有銘之偏極化光罩

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